

PATENT SPECIFICATION (11)

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(54) METHOD FOR CONSTRUCTING AN INDUSTRIAL PLANT ON LAND

(71) We, MITSUBISHI JUKOGYO KABUSHIKI KAISHA, a Japanese body corporate of 5—1, Marunouchi 2-chome, Chiyoda-ku, Tokyo Japan, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The present invention relates to a method for constructing on land various kinds of industrial plants such as a chemical plant, a water freshening plant or a power plant.

Heretofore, upon construction of these plants, after a great many machines, apparatuses and parts manufactured in a factory had been transported to the place of construction, various complex processes such as assembling, installation, mutual connections of machines and apparatuses via pipings, instrumentation work, electric work, and further various kinds of tests and test operations, were necessitated.

However, these heretofore known methods for constructing a plant involved problems that the period and cost of the construction would vary greatly because the working environment in broader means is widely different depending upon the circumstances of the place of construction, and that a lot of unexpected dangers would arise in association with transportation on land and field working.

According to the present invention there is provided a method of constructing an industrial plant on land, which method includes the steps of (a) constructing a plant structure comprising at least a part of the plant at a first location in a manner such that the plant structure has a floating capability; (b) floating the plant structure along a waterway; (c) thereafter isolating a region around the plant structure from the waterway; (d) subsequently raising the water level within the isolated region to transport the plant structure to a second location along the water surface at a higher water level than that of the waterway; and (e) causing the plant structure to settle on land at the second location at a level higher than the water surface of the waterway.

Preferably, the plant structure is caused to settle by reducing the water level in the isolated region.

The steps of isolating a region around the plant structure and raising the water level within the isolated region may be repeated a plurality of times.

The method may include the step of pumping out the water in the isolated region after the plant structure has been caused to settle on land.

A canal may be employed as the region to be isolated.

For a better understanding of the present invention and to show how it may be carried into effect, reference will now be made, by way of example to the accompanying drawings, in which:—

Fig. 1 is a cross-section view of an industrial plant structure which is to be constructed in accordance with the present invention; and

Figs. 2 to 6 are diagrammatic views showing the successive steps in the process for installing the plant structure at a desired position.

Referring now to Fig. 1 of the accompanying drawings, which shows one preferred embodiment of the plant structure having a floating capability and employed in a method according to the present invention, a main body 1 having a floatable structure is composed of water-tight side outer plates 1a, a double bottom 1b, decks 1c, etc., and on the main body 1 are equipped a reaction tower 2 and various machines and apparatuses 3 to 7. In addition, piping work, instrumentation work, electric work, etc. are applied to the main body 1. Thus the construction work is carried out until it reaches a state where equipment as a chemical plant has been almost completed and thereby a plant structure A having a floating capability is produced.

This plant structure A is constructed within a dock, and if necessary, its test operation is also conducted within the dock.

Subsequently, by pouring water into the dock the plant structure A is made to float on the water and is transported to a desired

position along a waterway by towing or by self-propulsion.

Fig. 2 shows the state where the plant structure A has arrived at a water region 10 in the proximity of a desired installation position 9 having been towed along a waterway 8. Thereafter this water region 10 has been blocked from the waterway 8 by an embankment 11.

Under the state shown in Fig. 2, if water is pumped into the water region 10 inside of the embankment 11 then the state shown in Fig. 3 is realised where the water level is higher than the level of the land at the desired position 9 which is again higher than the water surface of the waterway 8, whereby the plant structure A can be easily led to the desired position 9 on land as shown in Fig. 4.

Subsequently, upon pumping out water from the water region 10 around the plant structure A, the plant structure A settles on the desired position 9 on land and is installed there, resulting in the state shown in Fig. 5. Soil 12 is thrown in the channel around the plant structure A and when the land in this region has been readjusted, the plant structure A has been installed as a plant on land as shown in Fig. 6. It is to be noted that the embankment 11 can be utilised as a breakwater or as a protective wall upon damage of the plant, even after installation of the plant structure A as shown in Fig. 6.

Where the desired position 9 where the plant structure A is to be installed is located on the shore, naturally the sea can be used as the waterway 8. Where the desired position 9 is located at an inland area, rivers or canals may be utilised or a canal may be newly constructed to be used as a waterway, and the plant structure A can be made to navigate along these waterways. A portion of the hull of a scrapped vessel can be used as the main body 1 of the plant structure A.

While the step of raising the water level within the blocked water region to raise the plant structure was carried out only once in the illustrated embodiment, the steps of blocking a water region and raising the water level within the blocked water region could be carried out a plurality of times along the length of the waterway, if necessary, to transport the plant structure to a position on land at a desired level.

Since installation of various machines and apparatuses, assembly of parts, piping work, and electric work on the main body having a floatable structure can be almost completed in a factory such as a dock, and since

the thus constructed plant structure can be made to float on the water for transportation and it can be transported as a whole to a desired position on land, the various necessary operations and the construction work can be greatly simplified and can be well monitored and controlled.

WHAT WE CLAIM IS:—

1. A method of constructing an industrial plant on land, which method includes the steps of (a) constructing a plant structure comprising at least a part of the plant at a first location in a manner such that the plant structure has a floating capability; (b) floating the plant structure along a waterway; (c) thereafter isolating a region around the plant structure from the waterway; (d) subsequently raising the water level within the isolated region to transport the plant structure to a second location along the water surface at a higher water level than that of the waterway; and (e) causing the plant structure to settle on land at the second location at a level higher than the water surface of the waterway.

2. A method according to claim 1, wherein the plant structure is caused to settle by reducing the water level in the isolated region.

3. A method according to claim 1 or 2, wherein the steps of isolating a region around the plant structure and raising the water level within the isolated region are repeated a plurality of times.

4. A method according to claim 1, 2 or 3, and including the step of pumping out the water in the isolated region after the plant structure has been caused to settle on land.

5. A method according to any preceding claim, wherein a canal is employed as the region to be isolated.

6. A method for constructing a plant on land substantially as hereinbefore described with reference to Figures 2 to 6 of the accompanying drawings.

7. A plant constructed by a method according to any one of claims 1 to 6.

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COMPLETE SPECIFICATION

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FIG. 1

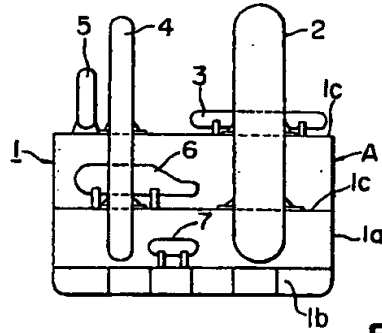


FIG. 4

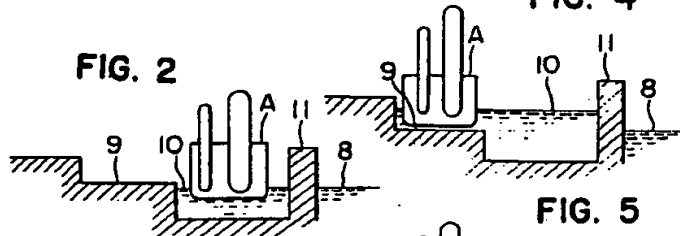


FIG. 5

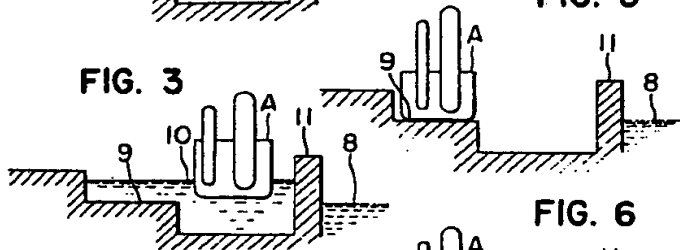


FIG. 6

